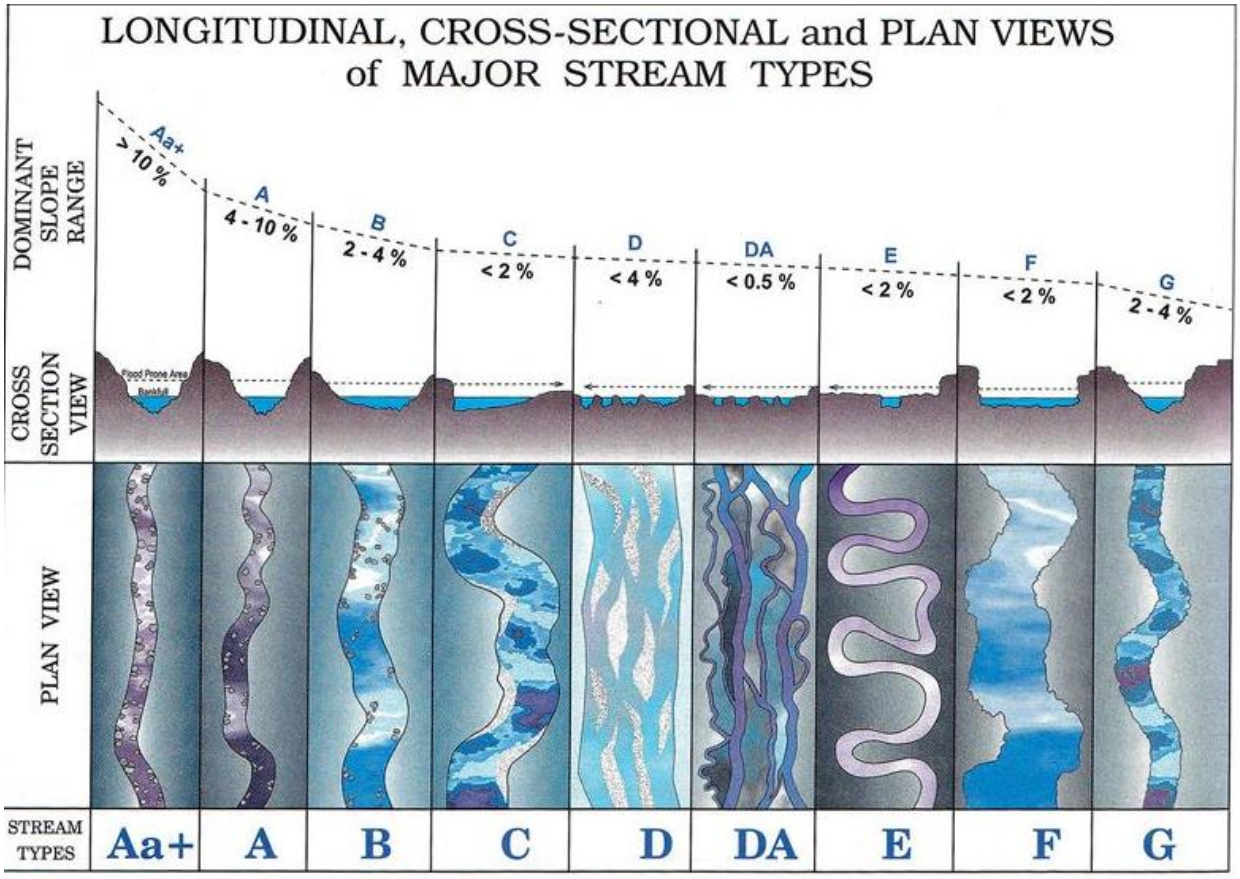
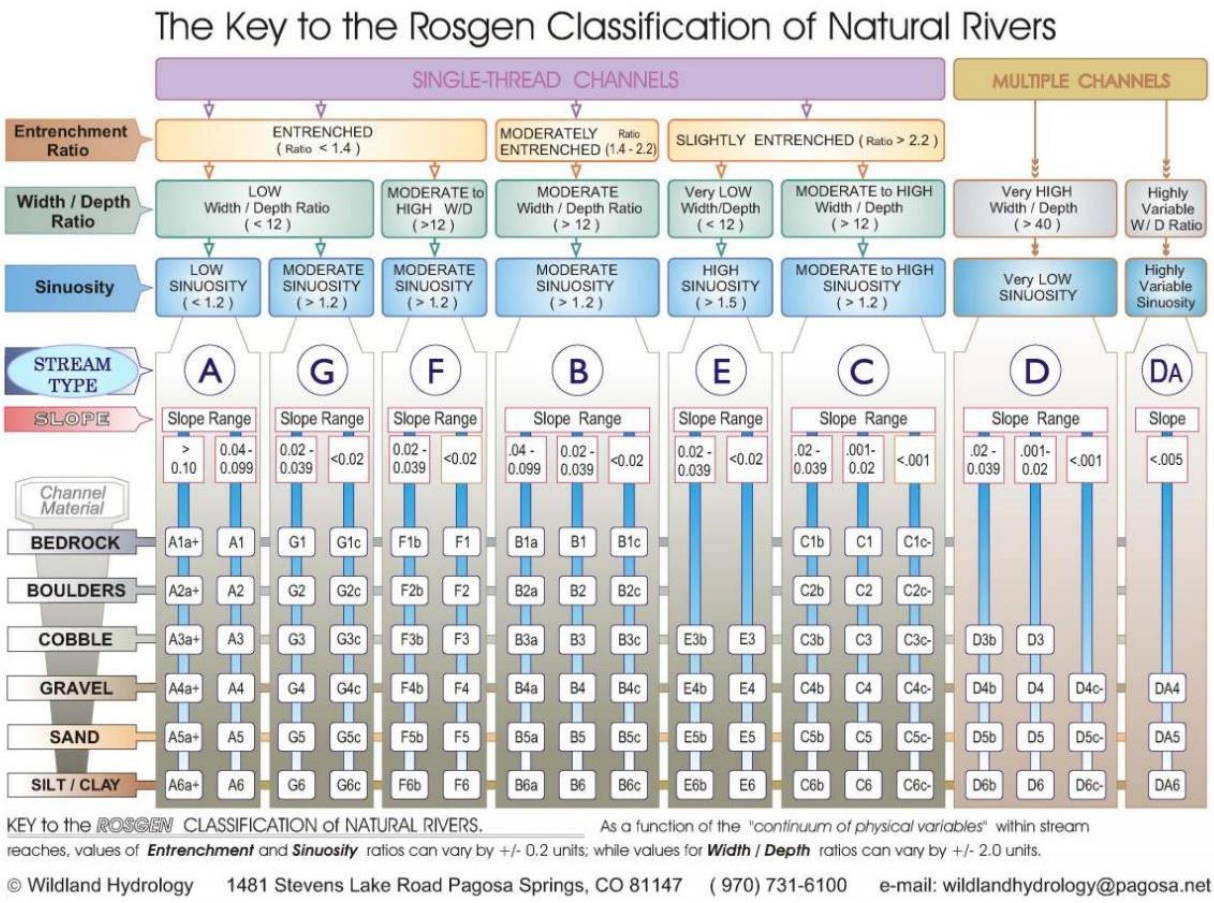
AQ-0021 Rosgen Channel Typing and Stream Channel Characteristics





Channel Classification – Rosgen Channel Typing

As mentions earlier, a series of 3 measurement sets, spaced thru out the reach, are made to help determine the channel classification. These measurements can recorded on a Reach level top form in the logger or on a separate form. Refer to the copy of the Rosgen Reach Channel Classification Form located in the appendix.

Since these measurements are at and around bankfull, a short description of bankfull is as follows

Identify Bankfull Elevation

Examine the bankfull indicators (described below) throughout the reach to identify the bankfull elevation. Recognize that all six indicators are rarely present at an individual site.

- Examine streambanks for an active floodplain. This is a relatively flat, depositional area that is commonly vegetated and above the current water level unless there is a large amount of spring runoff or there has been a substantial rain event (i.e. stream running at bankfull stage).
- Examine depositional features such as point bars. The highest elevation of a point bar usually indicates the lowest possible elevation for bankfull stage. However, depositional features can form both above and below the bankfull elevation when unusual flows occur during years

preceding the survey. Large floods can form bars that extend above bankfull whereas several years of low flows can result in bars forming below bankfull elevation.

- A break in slope of the banks and/or change in the particle size distribution from coarser bed load particles to finer particles deposited during bank overflow conditions.
- Define an elevation where mature key riparian woody vegetation exists. The lowest elevation of birch, alder, and dogwood can be useful, whereas willows are often found below the bankfull elevation.
- Examine the ceiling of undercut banks. This elevation is normally below the bankfull elevation.
- Stream channels actively attempt to reform bankfull features such as floodplains after shifts or down cutting in the channel. Be careful not to confuse old floodplains and terraces with the present indicators.

Identify Bankfull Height

After you identify bankfull elevation, measure the vertical distance from the water's surface to the dominant bankfull height measured throughout the reach. This vertical distance can be used when bankfull indicators are not present at a particular point along the streambank. Bankfull height is needed for streambank measurements, bankfull widths, pebble counts, large wood, and cross-sections

Making a measurement set

There is no set distance along the reach where you will take the measurements, however as stated earlier, they should be spread out along the reach. Pick spots the represent the channel and not an outlying intrusion. Areas to avoid may be places where the stream is over wide, on stream bends, or where bankfull indicators are poor. Long straight stretches of riffles are best. Mid channel bars can be present, but the measurement of the bankfull width will vary depending on height of the bar, as a figure below illustrates. Here are the steps to follow

- Identify the bank with the best bankfull indicator
- Take a bank pin thru the end of the tape and place the pin at bankfull with tape flush with the ground surface. This may be difficult in banks with lots of rock. Do the best you can, moving around as necessary as long as you maintain the same bankfull level on the bank.
- Stretch the tape across the channel perpendicular to the flow to the other side and locate bankfull elevation on the far side. Please the bank pin at the far side bankfull, and wrap the tape around the pin flush with the ground. Make sure the tape is taught with no sag as much as possible. If you have a third pin, you can place it thru the tape handle hole, lock the crank so the knob won't turn , and place the pin upstream of the transect tightly. This helps keeping it taught while you take a measurement
- A good way to check your elevations is to measure the water surface elevation along both banks with the depth pole (water surface to the tape). If the two height measurements are within 2 cm difference, then you are go to go. If not, reset the bankfull elevation you are least sure up or down, and re-check.
- One the tape is set up, record the width
- Next, take 3 depth measurements (channel bottom to the tape) at 255, 50% and 75% of the distance across. You can divide the width by 4 to get a 25% distance. All the rest are multiples.

- Along the transect line, locate the deepest spot (max depth) and note the height from the deepest point in the channel to the tape. There is no spot on the form or in the logger for this measurement. You want to double this measurement to get 2x max depth height. There is a spot on the form for this measurement but not in the logger.
- Take down the tape. With one person hold the 0 end of the tape at the 2x max depth point on the pole. The pole is still located at that max depth location along the transect line. The other person will then stretch the tape as far as she/he needs to go to find the floodprone point on the bank, keeping the tape as level as possible. Repeat going the other way. Add those two distance measurements to come up with the floodprone width for site #1. If you have three people, one person can go to the right and the other to the left, with the third holding the tape at the 2x max depth point on the pole, and save time. If it looks like the floodprone widths are going to be way out past over 100 feet on either side, I would just estimate the distance. It won't make much difference in the overall entrenchment ratio in the end. Floodprone distance gets entered on the form or in the logger
- Take a gradient reading up and down that gets averaged at each site
- Repeat these steps for the other two sites
- The form and logger has spots to note channel braiding type, single or multiple, sinuosity, low to very high, and an ocular estimate of the particle size distribution. Don't split hairs, just give your best estimate. Sinuosity of the reach can be determined from a ArcMap. Reach Length/Valley Length=Sinuosity
- The math on the forms can be done in the office or truck as time allows.
- We have Rosgen field guides for stream classification as a reference to aid in channel typing
- If the reach that is being surveyed happens to have a RSI (Riffle Stability Index) survey scheduled, the bankfull measurements may be skipped. Riffle Stability Index surveys collect the same information, only at more intensive level. For full stream inventories, only the bottom reach will have a RSI conducted. Therefore, all the other reaches beyond the lower reach will continue have a more rudimentary channel classification survey done.

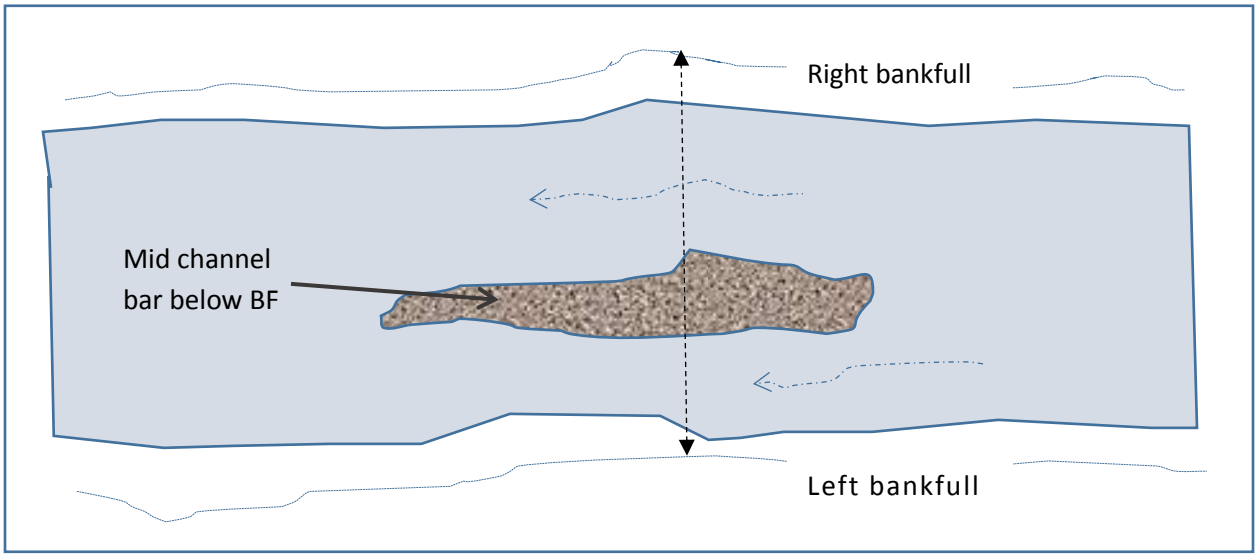


Figure 4 – bankfull width when a mid-channel bar is below bankfull elevation

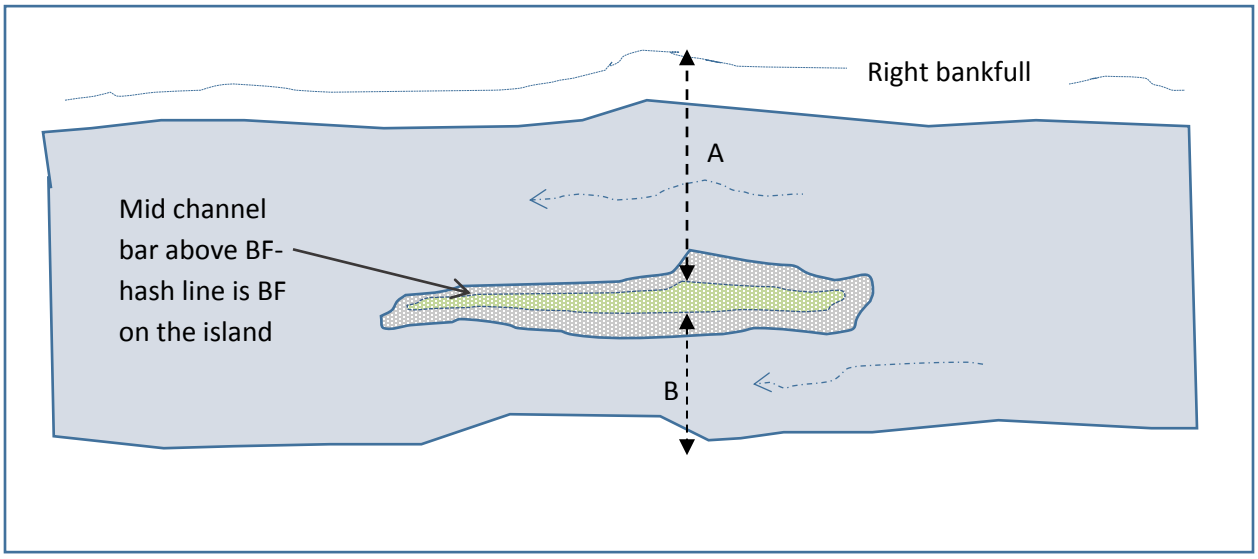


Figure 5 – bankfull width when a mid-channel bar is an island above bankfull elevation

In figure # 4, the height of the mid channel bar lies below the bankfull elevation, there the bar is under water during bankfull flow and the bankfull width will be from bank to bank.

In figure #5, the mid channel bar lies above bankfull elevation where the tape crosses, so the total width will be Right bankfull to right bankfull elevation (bar) + Left bankfull (bar) to left bankfull (A+ B=bankfull width).